
ग्रीस, ग्रेफाइटेटेड — विशिष्टि
(पांचवां पुनरीक्षण)

Grease, Graphited — Specification
(Fifth Revision)

ICS 75.100

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FOREWORD

This Indian Standard (Fifth Revision) was adopted by the Bureau of Indian Standards after the draft finalized by the Lubricants and their Related Products Sectional Committee had been approved by the Petroleum, Coal and Related Products Division Council.

This Standard was first published in 1963 and subsequently revised in 1965, 1973, 1981 and 1987.

In the fourth revision, Grade 2 was included in the standard to meet the defence requirements. Considerable assistance was derived from the standard 'Specification CS/653 Grease XG-280', published by the Ministry of Defence, U.K. in the fourth revision (1987).

In this fifth revision, kinematic viscosity requirements of mineral lubricating oils has been changed to ISO VG Grades and flash point requirements has also been modified accordingly. Clause for references is included and marking clause has been updated. SI units have been used.

Bibliographical references in this standard are given in Annex B.

The composition of the committee responsible for the formulation of this standard is given in Annex C.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard
GREASE, GRAPHITED — SPECIFICATION
(Fifth Revision)

1 SCOPE

1.1 This standard prescribes the requirements and the methods of sampling and tests for greases, graphite and use for general service under comparatively high load, low speed or low relative displacement of inter-acting surfaces requiring lubrication.

1.2 Greases covered in this standard are not intended to be used in ball and roller bearings.

2 REFERENCES

The following Indian Standards contain provisions which through reference in this text constitute the provisions of the standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

<i>IS No.</i>	<i>Title</i>	<i>IS No.</i>	<i>Title</i>
		(Part 25/Sec1) : 2018/ ISO 3104 : 1994	Transparent and opaque liquids, Section 1 Determination of kinematic viscosity and calculation of dynamic viscosity (<i>second revision</i>)
		(Part 40) : 2015/ ISO 3733 : 1999	Petroleum products and bituminous materials — Determination of water — Distillation method (<i>fourth revision</i>)
		(Part 51) : 1963	Copper strip corrosion test for lubricating greases
		(Part 52) : 2017/ ISO 2176 : 1995	Drop point (<i>second revision</i>)
		(Part 53) : 1979	Determination of acidity and alkalinity of greases (<i>first revision</i>)
495 : 1967	Specification for graphite, flake for lubricants (<i>first revision</i>)	(Part 58) : 1991	Determination of insolubles in greases (<i>first revision</i>)
1447 (Part 3) : 2021	Method of sampling of petroleum and its products: Part 3 Method of sampling of semi-solid and solid petroleum products (<i>second revision</i>)	(Part 59) : 1991	Determination of mineral oil content in greases (<i>second revision</i>)
		(Part 60) : 1994	Consistency of lubricating greases by cone penetrometer (<i>second revision</i>)
1448	Methods of tests for petroleum and its products	(Part 61) : 1974	Evaporation loss in greases (2 hour drying) (<i>first revision</i>)

<i>IS No.</i>	<i>Title</i>
(Part 62) : 1974	Heat stability of greases (<i>first revision</i>)
(Part 69) : 2019/ ISO 2592 : 2017	Determination flash and fire points — Cleveland open cup method (<i>second revision</i>)
7794 : 1984	Specification for manual portable grease guns (<i>first revision</i>)
9466 : 2020	Viscosity classification for industrial liquid lubricants (<i>first revision</i>)

3 GRADES

The following three grades of graphite greases are covered in this standard and these may be used for hydraulic rams, plungers, slides, elevator cables, leaf springs, lift guides, pantograph pans, cam and cam dog surfaces in brake control valves of diesel locomotives and as protective for steel wire ropes and certain anti-seize purposes, in temperate and tropical climates:

- a) Grade 1,
- b) Grade 2, and
- c) Grade 3.

4 REQUIREMENTS

4.1 Description

The material shall be a smooth and homogenous preparation, uniform in consistency and free from objectionable odour, deleterious materials and impurities, such as rosin, rosinates, tar oil and filters other than graphite. It shall not show any sign of breakdown, hardening or tendency of the constituents to separate.

4.2 Composition

The material shall be prepared from the following ingredients in such proportions as to comply with the requirements prescribed in Table 1.

4.2.1 Mineral Lubricating Oil

The mineral lubricating oil extracted from grease by method 'A' prescribed in IS 1448 (Part 59) shall be of following viscosity grades, as mentioned in IS 9466:

Sl No.	Characteristic	Requirement			Method of Test, Ref to Parts of IS1448
		Grade 1	Grade 2	Grade 3	
(1)	(2)	(3)	(4)	(5)	(6)
i)	Viscosity Grade	ISO VG 68	ISO VG 100	ISO VG 68	Part 25/Sec 1
ii)	Flash point, °C, <i>Min</i>	190	220	190	Part 69

4.2.2 Calcium Based Soap

4.2.3 Graphite — conforming to IS 495.

4.3 Keeping Quality (Shelf Life)

The keeping quality of the material shall be such that when stored in original sealed container, under normal conditions, it shall retain the properties given in the specification for not less than one year

from the date of manufacture of the product.

4.4 The material shall also comply with

the requirements given in Table 1 when tested according to the methods given in col 6 of Table 1 as parts of IS 1448 and annexes, Table 1.

Table 1 Requirements for Grease, Graphited

(Clauses 4.2 and 4.4)

Sl No.	Characteristic	Requirements			Methods or test, ref to Part of IS 1448/ Annex /ASTM
		Grade 1	Grade 2	Grade 3	
(1)	(2)	(3)	(4)	(5)	(6)
i)	Penetration of worked material at $25 \pm 0.5^\circ\text{C}$ (60 double Strokes)	310 to 340	265 to 295	175 to 205	Part 60
ii)	Graphite content, percent by mass	6 to 15	4.5 to 5.5	45 to 55	Part 58
iii)	Drop point, $^\circ\text{C}$, <i>Min</i>	95	100	95	Part 52
iv)	Copper strip corrosion test, at 75°C for 24 h	Negative	Negative	Negative	Part 51
v)	Water content, percent by mass, <i>Max</i>	1.5	1.0	2.0	Part 40
vi)	Free acidity (as oleic acid), percent by mass, <i>Max</i>	0.5	0.5	0.5	Part 53
vii)	Free alkalinity [as Ca (OH) ₂], percent by mass, <i>Max</i>	0.25	0.15	0.25	Part 53
viii)	Heat stability at $120 \pm 1^\circ\text{C}$, for 1 h	—	Shall pass the test	—	Part 62 Method A
ix)	Low temperature pumping properties	—	Shall pass the test	—	A
x)	Glycerin content, percent by mass, <i>Max</i>	—	0.25	—	D128

5 PACKING AND MARKING

5.1 Packing

Material shall be supplied in metal drums or other suitable containers of appropriate

size and strength to withstand handling during storage and transport.

5.2 Marking

Material shall be marked with the

following information:

- a) Name and type of the material;
- b) Manufacturer's name, initials or trade-mark, if any;
- c) Net mass of material;
- d) Identification in code or otherwise to enable the lot of consignment or manufacture to be traced back from records; and
- e) Any other statutory requirements.

5.2.1 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act, 2016* and the Rules and Regulations framed thereunder, and the products may be marked with the standard mark.

6 SAMPLING

Representative samples of the material shall be drawn as prescribed in IS 1447(Part 3).

6.1 Number of tests

All characteristics given in the specification shall be tested on the composite sample.

6.2 Criteria for Conformity

Tests for consistency and graphite content shall be done on individual samples and other tests on composite sample. The lot shall be declared satisfactory only if all individual and composite samples pass the requirements of this standard.

ANNEX A

[Table 1, Sl. No (ix)]

DETERMINATION OF LOW TEMPERATURE PUMPING PROPERTIES**A-1 APPARATUS****A-1.1 Grease Gun** — Push Type (*see* IS7794).**A-1.2 Refrigerator** — Capable of being maintained at $-18 \pm 1^{\circ}\text{C}$.**A-2 PROCEDURE****A-2.1** Fill the gun with grease and place in a refrigerator at -18°C .**A-2.2** Maintain the test temperature for 24 h.**A-2.3** Remove the gun from the refrigerator and operate it immediately.

NOTE — Protective gloves should be worn during the test.

ANNEX B**BIBLIOGRAPHY**

<i>Standard</i>	<i>Title</i>
ASTM D128-98	Standard test methods for analysis of lubricating grease

ANNEX C

(Foreword)

COMMITTEE COMPOSITION

Lubricants and their Related Products Sectional Committee, PCD 25

<i>Organization</i>	<i>Representative(s)</i>
Gulf Oil Lubricants India Limited, Mumbai	DR Y. P. RAO (Chairman)
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Association of State Road Transport Undertakings, New Delhi	REPRESENTATIVE
Bajaj Auto Limited, Pune	REPRESENTATIVE
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